

## Understanding by Design

Designer Name(s): Young and Cowser

Date: 6/9/14

Subject Area: Math

Grade Level(s):3rd

Unit Title/Focus: Section 10 (Lessons 91-100)

Estimated Amount of Instructional Time: ~ 14 days

### Stage 1 – (Desired Results)

State Content and Skill Standards: **CCSS and section overview card**

Mathematic Claim #1: Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.

Domain: Operation and Algebraic Thinking

Target A. (3.OA.A) Represent and solve problems involving multiplication and division. (DOK 1)

Gr. 3 Standards: 3.OA.1, 3.OA.4,

**3.OA.1:** Interpret products of whole numbers, e.g., interpret  $5 \times 7$  as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as  $5 \times 7$ .

**3.OA.4:** Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations  $8 \times ? = 48$ ,  $5 = \square \div 3$ , and  $6 \times 6 = ?$ .*

Target B. Understand properties of multiplication and the relationship between multiplication and division. (DOK 1)

Gr. 3 Standards: 3.OA.6

**3.OA.6** Understand division as an unknown-factor problem. *For example, find  $32 \div 8$  by finding the number that makes 32 when multiplied by 8.*

Target C.(3.OA.C) **Multiply and divide within 100. (DOK 2)**

Gr. 3 Standards:3.OA.7

**3.OA.7** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that  $8 \times 5 = 40$ , one knows  $40 \div 5 = 8$ ) or properties of operations. By the end of Grade 3 know from memory all products of two one-digit numbers.

Target D.( 3.OA.D) Solve problems involving the four operations, and identify and explain patterns in arithmetic. ( DOK 2)

Gr. 3 Standards: 3.OA.8, 3.OA.9

**3.OA.8** Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

**3.OA.9** Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

Domain: Numbers and Operations in Base Ten

Target E. (3.NBT.E) - Use place value understanding and properties of operations to perform multi-digit arithmetic. (DOK 1)

Gr. 3 Standards: 3.NBT.2

**3.NBT.2** Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

**Target F. (3.NF.A) - Develop understanding of fractions as numbers. (DOK 1, 2)**

Gr. 3 Standards: 3.NF.1,3.NF.2a, 3.NF.2b,3.NF.3a, 3.NF.3b,3.NF.3d

**3.NF.1** Understand a fraction  $1/b$  as the quantity formed by 1 part when a whole is partitioned into  $b$  equal parts; understand a fraction  $a/b$  as the quantity formed by  $a$  parts of size  $1/b$ .

**3.NF.2** Understand a fraction as a number on the number line; represent fractions on a number line diagram.

**a.** Represent a fraction  $1/b$  on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into  $b$  equal parts. Recognize that each part has size  $1/b$  and that the endpoint of the part based at 0 locates the number  $1/b$  on the number line.

**b.** Represent a fraction  $a/b$  on a number line diagram by marking off  $a$  lengths  $1/b$  from 0. Recognize that the resulting interval has size  $a/b$  and that its endpoint locates the number  $a/b$  on the number line.

**3.NF.3** Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

**a.** Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.

**b.** Recognize and generate simple equivalent fractions, e.g.,  $1/2 = 2/4$ ,  $4/6 = 2/3$ . Explain why the fractions are equivalent, e.g., by using a visual fraction model.

**d.** Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols  $>$ ,  $=$ , or  $<$ , and justify the conclusions, e.g., by using a visual fraction model.

**Domain: Measurement and Data**

**Target G. (3.MD.A)- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. (DOK 1, 2)**

Gr. 3 Standards: 3.MD.2

**3.MD.2** Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (L). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

**Target H. (3.MD.B)- Represent and interpret data. (DOK 2)**

Gr. 3 Standards: 3.MD.4

**3.MD.4** Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

**Domain: Geometry**

**Target K.( 3.G.A) Reason with shapes and their attributes. ( DOK 1, 2)**

**Gr. 3 Standards: 3.G.2**

**3.G.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.**

**Enduring Understandings:** (what are the big ideas, what are the specific understandings desired)

Students will understand that...

- Fractions are used to describe the size of each piece of an object that has been divided into equal parts
- Geometric shapes can be classified by their attributes
- Geometric figures can have different angles

**Essential Questions:** (what questions will foster inquiry, understanding, and transfer of learning)

- How do I know which fraction to use to describe a part of a whole?
- How do I know if a shape is a quadrilateral?
- How are a trapezoid and a rectangle alike? Different?

Extend and Challenge Questions

- Activity 9 & 10- What patterns do you see on the charts?

**Big Idea(s)/ Real World Application**

**Students will be able recognize quarter, half, and whole intervals on a clock.**

**Students will be able to read and measure quarter, half, and whole intervals on a ruler.**

**Student will be able to determine which unit of measurement to use based on the weight or mass that needs to be measured.**

**What Students will know:** (what knowledge will they acquire)

Math Vocabulary- equivalent fraction, fifths, gram, kilogram, line plot, mass, milligram, mixed number, ounce, parallel line segment, pound, tenths

- The larger the denominator, the more the whole is divided into (smaller pieces)
- Mixed number is greater than 1 whole
- Basic Multiplication Facts
- Which unit of measurement to use based on the weight or mass that needs to be measured
- Parallel lines are an equal distance apart and will never intersect
- Quarter, half, and whole intervals on a ruler
- Quarter, half, and whole intervals on a clock

**What Students will be able to do:** (what will they eventually be able to do as a result of their skills learned/knowledge)

**(Saxon Lesson Objectives)**

Students will be able to

- Subtract 2 and 3 Digit Numbers
- Compare and Order Fractions
- Multiply by 3
- Identify Units of Weight
- Subtract Money Amounts with Decimals
- Tell and Show Time to Quarter Hour
- Show Fractional Amounts Greater than 1
- Measure and Draw Line Segments to Nearest Quarter Inch
- Identify Parallel Lines
- Identify Properties of Quadrilaterals

**Stage 2 - Assessment Evidence (acceptable assessment evidence that students understand)**

**Performance Tasks:** (what authentic performance task (s) will students demonstrate understanding; by what criteria will it be judged?)

- Make an Organized List to Solve a Problem (Combinations)

**Other Evidence:** (quizzes, tasks, academic prompts, homework, observations)

- Cumulative Written Assessments 95-1, 95-2, 100-1, 100-2
- Oral Assessment 10

<ul style="list-style-type: none"> <li>Identify Parallel Lines and Properties of Quadrilaterals</li> </ul>	<ul style="list-style-type: none"> <li>Teacher Observations</li> <li>Guided Practice</li> <li>Homework Practice</li> <li>Fact Practice</li> </ul>
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**Stage 3 - Learning Plan (sequence of teaching and learning activities that will produce desired understandings, engagement and development) Use WHERETO elements to help you:**

*Learning Activities:*

**Saxon Table of Contents Section 10**

Lesson 91- Subtracting 2 and 3 Digit Numbers

Literature Connection: **The Smushy Bus** by Leslie Helakoski

Lesson 92- Subtracting 2 and 3 Digit Numbers

Lesson 93- Comparing, Ordering, Adding, and Subtracting Fractions with Denominators of 2, 3, 4, and 8 Using Fraction Strips

Lesson 94- Comparing, Ordering, Adding, and Subtracting Fractions with Denominators of 2, 3, 4, 5, 6, 8, and 10 Using Pictures

Lesson 95-1- Multiplying by 3

Lesson 95-2- Identifying Units of Weight and Mass: Ounces, Pounds, Tons, Grams, and Kilograms and Estimating Mass

Lesson 96- Subtracting Money Amounts (Decimals) Subtracting Across Zeros

Lesson 97- Telling and Showing Time to the Quarter Hour

Lesson 98- Showing Fractional Amounts Greater than 1 and Writing Mixed Numbers

Lesson 99- Measuring and Drawing Line Segments to the Nearest Quarter Inch

Lesson 100-1- Multiplying by 4 and Making an Organized List to Solve a Problem

Lesson 100-2- Identifying Parallel Lines and Identifying Properties of Quadrilaterals

Journal Writing:

- Tim subtracted 370 from 510. His answer was 260. Pretend you are the teacher. How would you explain to him what he did wrong? Explain what you would do to help him find the correct answer. (Lesson 92)
- Write an equal-groups story problem for a multiplying by 3 fact. (Lesson 95-1)
- Write about how you would weigh something that is too large to fit on a bathroom scale. (Lesson 95-2)
- Pretend you are shopping for clothes to wear to school. You have \$100 to spend. Describe one thing you would buy and how much it would cost. How much would you have left? (Lesson 96)
- If you had a quarter of an hour of free time in school, explain what you would do. (Lesson 97)
- Create and draw an insect that is  $1\frac{3}{4}$  inches long. Describe your insect. (Lesson 99)
- Write the name of something on the playground that has parallel line segments. Write 3 clues to help someone guess the object. (Lesson 100-2)

W=help the students know WHERE the unit is going and WHAT is expected/Help teacher to know where the students are coming from (prior knowledge, interests)

H=HOOK all students and hold their interest

E=EQUIP students, help them EXPERIENCE the key ideas and EXPLORE the issue

R=Provide opportunities to RETHINK and REVISE their understanding/work

E (2)=Allow students to EVALUATE their work

T=Be TAILORED (personalized) to different needs, interests, and abilities of learners

O=Be ORGANIZED to maximize initial and sustained engagement as well as effective learning

<b>Assessment Tasks that Provide Evidence for Claims including DOK</b>	<input type="checkbox"/> <b>Claim #1/DOK 1, 2, 3, 4 (circle one):</b>
	<input type="checkbox"/> <b>Claim #2/DOK 1, 2, 3, 4 (circle one):</b>
	<input type="checkbox"/> <b>Claim #3/DOK 1, 2, 3, 4 (circle one):</b>
	<input type="checkbox"/> <b>Claim #4/DOK 1, 2, 3, 4 (circle one):</b>
<b>Achievement Level Descriptors</b>	<b>ALD #1:    ALD #2:    ALD #3:    ALD #4:    (circle one):</b>
<b>Materials/Resources</b>	<b>Saxon Math</b>

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